

Remarks

Further and favorable reconsideration is respectfully requested in view of the foregoing amendments and following remarks.

The Examiner asserts that the incorporation of essential material in the specification by reference to a foreign application or patent, or to a publication is improper. However, Applicants point out that the Japanese application cited at the bottom of page 5 of the specification is the Japanese priority application on which the present U.S. application is based. Therefore, no essential material has been incorporated by reference.

Claims 1 and 12 have been amended to a non-woven fabric "consisting of a single layer." (See page 15, lines 17-22 of the specification.) This amendment does not limit the components of the layer itself, as indicated by the word "including" following "a single layer" but only requires that the non-woven fabric is a single layer.

The patentability of the present invention over the disclosures of the references relied upon by the Examiner in rejecting the claims will be apparent upon consideration of the following remarks.

Thus, the rejection of claims 1-3, 6, 7, 12-14, 17 and 18 under 35 U.S.C. § 103(a) as being unpatentable over Goettmann et al. is respectfully traversed.

The Examiner takes the position that Goettmann et al. teach a support comprising a non-woven fabric with a main fiber and a binder fiber formed of synthetic resin, manufactured by paper making process and then heating and pressing, having a tensile strength ratio between the machine and transverse direction within 2:1 to 1:1 and air permeability of 0.5-7 cc/cm²/sec.

As admitted by the Examiner, Goettmann et al. do not teach the porosity of the membrane as being between 5 and 15 microns as presently claimed. The Examiner asserts that it would be obvious to one of ordinary skill in the art at the time of invention that since the non-woven as taught by Goettmann et al. has materials and properties similar to what is disclosed by the instant application, and is made by similar methods, the pore size also would be inherently similar.

However, Applicants respectfully disagree with the conclusion that the pore size would be similar, since pore size can be adjusted independently of the materials, properties and production methods. That is, even if the present invention employs similar materials, properties and production methods as in Goettmann et al., this would not necessarily lead to similar pore size. For example, the air permeability in Goettmann et al. can be achieved by fewer larger pores or a greater number of smaller pores, regardless of the materials and production methods employed. Therefore, contrary to the assertion made by the Examiner, one of ordinary skill in the art would not predict, with any reasonable certainty, that the pore size of the non-woven fabric employed in the present invention is the same as or similar to the pore size in Goettmann et al.

Furthermore, Applicants' invention is drawn to a semipermeable membrane support, as specifically set forth in the preamble of the claims. It appears that the Examiner has ignored this limitation in judging the patentability of the present invention. However, a preamble is given the effect of a limitation, if it is "considered necessary to give life, meaning, and vitality to the claims." Kropa v. Robie, 187 F.2d 150, 88 USPQ 478 (CCPA 1951). The Kropa court stated:

In the case before us, the words 'An abrasive article' are essential to point out the invention defined by the counts. In our judgment those introductory words give life and meaning to the counts, for it is only by that phrase that it can be known that the subject matter defined by the claims is comprised as an abrasive article. Every union of substances capable inter alia of use as abrasive grains and a binder is not an 'abrasive article'.

Applicants' claims are drawn to a semipermeable membrane support comprising a non-woven fabric of a single layer. As will be discussed in detail below, not every non-woven fabric of a single layer will result in a semipermeable membrane support. Therefore, following Kropa v. Robie, it is clear that the preamble of Applicants' claims must be considered a claim limitation.

A semipermeable membrane support, as claimed by Applicants, can not be made of natural materials such as cellulose, which has many hydroxyl groups, because they weaken the support's water-resistance. On the contrary, the non-woven composition of Goettmann et al. requires cellulose fibers. (See claims 1-14 of the reference). Goettmann et al. disclose a printable, high-strength, tear-resistant non-woven material. In particular,

Goettmann et al. teach a paper-like web composed of cellulosic, polyester and polypropylene fibers which provides a high strength printable protective wrap material. (See column 1, lines 7-12 of the reference). The claims of the reference specifically require 1 to 25 wt. % of cellulose fibers. Additionally, Goettmann et al. teach that the purpose of their invention is achieved generally by providing a composite material comprising a cellulosic material such as wood pulp, and polypropylene and polyester fibers of various lengths, diameters and melting points. (See column 2, lines 12-18 of the reference).

However, the use of cellulose fibers in a non-woven fabric, as in Goettmann et al., would defeat the very purpose of Applicants' invention, i.e. providing a semipermeable membrane support. A semipermeable membrane support made of cellulose fibers would be expanded by water during water separation, resulting in the deterioration of the physical strength of the cellulose fibers. Therefore, the support would not be strong enough to withstand the pressure necessary for the semipermeable membrane to perform its separation function, or the counter pressure for cleaning the semipermeable membrane, both of which are fundamental requirements for a semipermeable membrane.

Furthermore, if a microorganism came into contact with a semipermeable membrane support made of cellulose fibers, it would proliferate and begin decomposing the cellulose, resulting in deterioration of the strength of the support, and hence its ability to support a semipermeable membrane, therefore defeating the purpose of the invention.

Additionally, Goettmann et al. teach that their high strength paper-like webs made of synthetic non-woven composites have diverse application as insulating housewrap, bookbinding and protective wrap materials. (See column 1, lines 15-18 of reference). For applications such as these, it is advantageous to provide a paper-like material which is printable and characterized by high tear resistance. (See column 1, lines 18-20 of reference). Therefore, the purpose of the non-woven composition of Goettmann et al., as well as the composition itself, differs greatly from Applicants' semipermeable membrane support comprising a non-woven fabric.

In summary, the use of cellulose fibers is contrary to Applicants' claimed invention, and would defeat the very purpose of the invention, which is to provide a semipermeable membrane support. Therefore, one of ordinary skill in the art would not

employ cellulose fibers in a semipermeable membrane support, nor would he/she look to the teachings of Goettmann et al. to make a semipermeable membrane support.

For these reasons, Applicants take the position that the present invention is clearly patentable over Goettmann et al.

The rejection of claims 1-3, 6-8, 12-14, and 17-19 under 35 U.S.C. § 103(a) as being unpatentable over Shinjou et al. is respectfully traversed

The Examiner takes the position that Shinjou et al. teach a semipermeable membrane support comprising a non-woven fabric of a single layer with a main fiber and a binder formed of synthetic resin, manufactured by a paper making process and then heating and pressing. The Examiner asserts that the limitation "of a single layer" does not exclude a non-woven fabric of a single layer from having another layer laminated to it.

However, Applicants have amended claims 1 and 12 to recite "a non-woven fabric consisting of a single layer". (Emphasis added). The Shinjou et al. reference discloses only a double laminated layered structure, i.e., as described in "SUMMARY OF INVENTION" in column 2, beginning at line 40, stating:

The non-woven fabric has a combined laminated double layered structure which comprises a low density layer with an air permeability of 5 to 50 cc/cm²/sec and a high density layer with an air permeability of 0.1 cc/cm²/sec or more and less than 5 cc/cm²/sec. (Emphasis added)

More specifically, Example 1, beginning at column 6, line 14, states that, after preparing a high density sheet of polyester fibers (column 6, lines 6-12):

A web (in which other polyester fibers)... were blended, opened, and cross-laid with a cross-laier[layer] so that the fibers were oriented into the transverse direction, was laminated as the low density layer on the sheet. (Emphasis added).

Furthermore, Shinjou et al. explicitly exclude a single layer configuration, stating inferior results. In REFERENCE EXAMPLE 2 at column 7, the reference states:

A single layered support of 170 g/m² was prepared... it was observed that the penetrativity was insufficient. Partial delamination occurred between the membrane and support, and many pin-holes were generated. (Emphasis added).

Applicants' claims now exclude the double layered structure of the non-woven fabric as taught in the Shinjou et al. reference. One of ordinary skill in the art would not be motivated to employ a single layer structure instead of a double layer structure, and in fact, Shinjou et al. teach away from such a modification.


For these reasons, Applicants take the position that the present invention is clearly patentable over Shinjou et al.

Therefore, in view of the foregoing amendments and remarks, it is submitted that each of the grounds of rejection set forth by the Examiner has been overcome, and that the application is in condition for allowance. Such allowance is solicited.

Respectfully submitted,

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